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CHALLENGES FOR UNIVERSITIES TO ONLINE TECHNOLOGIES IMPLEMENTATION IN THE CONDITIONS OF WAR IN UKRAINE

Abstract. The experience of online education in Ukraine during wartime is unique. After the Russian-Ukrainian war beginning, in a month of so-called "holidays", in spring 2022, from April, 1, by the order of the Ministry of Education and Science of Ukraine and the rectors' orders of universities, online education started. The classes were online, and it was difficult to overcome the war stress, but the experience of the pandemic taught everyone to work with online technologies such as Zoom, Meet, and Google Classroom. Teaching students online was carried out as online as offline with the university platforms like Moodle and others for offline learning, they contained all educational materials from the previous two years of the pandemic, tasks, quizzes, and tests. The purpose of the research is to identify pedagogical, psychological, and technical challenges for teaching university students during the war in Ukraine with the survey method. The survey was conducted online with 65 university lecturers and 122 students from 5 universities in Kharkiv, Ukraine. The pedagogical, psychological, and technical difficulties were analyzed. The questions were aimed at studying such aspects as 1) pedagogical and psychological difficulties: the teachers/students' readiness for online teaching/learning, 2) pedagogical difficulties: the procedures of online teaching/learning and technologies, in particular, methods, forms, means of giving/mastering knowledge, 3) psychological and technical difficulties faced both by teachers and students. The results are as follows. The acquired teaching and learning experience with online technologies helped to establish online education in wartime positively in general. The main pedagogical difficulties were overcome with basic methods (online and offline), teaching forms such as lectures, seminars, and practical classes online, and offline, and, finally, different tools/means/platforms (video/audio recordings, corresponding emails, social networks, Moodle platform, etc.). The psychological state of both teachers and students in the circumstances of online education was also examined. The most common psychological difficulties with online learning were connected with external ones as constant shelling, and air alarms as with internal ones as stress, anxiety, worries, depression, burnout, sadness, and frustration. The technical difficulties were connected to blackouts, lack of Internet connection, power outages, evacuation, changes in living and working conditions, relocations, and the impossibility of using laboratory equipment. The conclusion is despite all online difficulties, the quality of teaching did not change significantly, thanks to the clear understanding that it is a necessity to teach and learn online.

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Keywords: online education; teaching technologies; learning tools; university students; Russian-Ukrainian war.

1. INTRODUCTION

Statement of the problem. The experience of online education in Ukraine during wartime is unique. After the Russian-Ukrainian war beginning, in a month of so-called "holidays", in spring 2022, from April, 1, by the order of the Ministry of Education and Science of Ukraine and the rectors' orders of universities, online education started.

The universities who stayed in the war zone survived explosions, shelling, and bombing. During the first weeks, the online university classes were like psychological therapy sessions, as the university lecturers listened and calmed students, helping them overcome the war stress. Then classes went back to usual online, as the experience of the pandemic taught everyone to work online using Zoom, Meet, and Google Classroom [1], [2], [3].

Teaching students was as online as offline with university platforms like Moodle and others, they contained all educational materials from the previous two years of the pandemic, tasks, quizzes, and tests. It is important to understand the peculiarities of teaching students [4] in wartime [5], as well as to answer the question of how Ukrainian university lecturers use various methods, forms, and techniques to continue their online activities to provide quality education and how students study online in the difficult wartime for the all-Ukrainian community. As it is known online technologies mean online, networking and electronic technologies with websites, wireless devices, electronic and virtual ones.

We agree that "as the history of armed conflicts shows, in any war, the education system becomes the arena of a battle, as it is the battle for people's minds and worldviews. In the conditions of the formation of the knowledge society and the aggravation of global contradictions, the war in the field of education becomes especially important" [6].

Analysis of recent research and publications.

The problems of online technology usage at universities using platforms like Zoom, Google Meet, and Google Classroom were analyzed previously [1]. University teachers faced the challenge of adapting to these virtual environments, learning to navigate the technology while maintaining engagement and connection with their students [2]. Students had to adjust to a new way of learning, often missing the in-person interactions and social aspects of traditional classrooms. Online teaching allows for flexibility in scheduling, making it easier for some students to balance their education with other responsibilities [3]. However, the digital divide [7] became apparent as not all students had access to reliable Internet and devices, exacerbating educational inequalities [8]. Zoom fatigue and screen time overload became real concerns, as extended periods of online classes took a toll on both students and teachers.

University teachers had to innovate, finding creative ways to make their virtual classrooms engaging through interactive activities, multimedia resources, and breakout sessions [9]. The collaboration tools within platforms like Google Classroom enabled group projects and assignments, promoting teamwork and peer interaction [10]. The pandemic pushed university teachers to improve their tech skills, leading to the development of a more tech-savvy teaching community [11]. The experience of teaching and learning online is analyzed, with both university teachers and students finding ways to adapt, thrive, and create new education opportunities [12] in the digital age [13].

Different problems of teaching and learning at universities during the war in Ukraine were investigated from different sides comparing e-learning during the pandemic and war [5]. The peculiarities of teaching students in wartime by the Ukrainian researchers show the education difficulties. Amid wartime, the challenges encountered by higher education in Ukraine, including those faced by university students and university teachers, underscore the importance

of assessing the accessibility and efficacy of remote learning: "the challenges the higher education of Ukraine, university students and teachers face in wartime, as well as considers accessibility and effectiveness of remote learning" [14].

The key education challenges described by authors with online technologies include the impact of war on university teachers and potential solutions to these challenges are outlined to address the current situation effectively: "the impact of the war on the teachers … the key challenges and outline possible solutions to present challenges" [15]. Amid the challenges in education, it is vital to prioritize equipping students with skills to navigate these difficulties and to establish stability, focus, contribution, and connection for them during the initial phases of the war in Ukraine: "the importance of helping our students develop skills to navigate these challenges … creating desperately needed stability, focus, contribution, and connection for students during the early days, weeks, and months of the war in Ukraine" [16].

The previous war conflicts were studied by researchers for education problems [17]. University education in war conflicts faced immense disruption, often resulting in damaged infrastructure, safety concerns, and resource limitations that can hinder the continuity of academic programs [18]. Students and university teachers in war regions confronted significant challenges, including displacement, restricted access to educational resources, and adapting to remote learning amidst conflict-related disruptions. Despite those hardships, many universities strived to provide education, fostering resilience and adaptability among students and faculty in the face of adversity [19].

However, the problem of understanding the effective online methods, forms, and techniques of teaching students [20] online at universities during the war in Ukraine through the surveys was not analyzed in detail.

The purpose of the research is to identify pedagogical, psychological, and technical challenges for teaching university students during the war in Ukraine with the survey method.

2. RESEARCH METHODS

This study was conducted online with university lecturers and students from 5 universities in Kharkiv, inviting them to take part in the survey by using two appropriate Google forms. A questionnaire consisting of 5 question groups was offered to participants. The first group of questions for teachers and students was aimed to find out gender, age, working experience, a specialization. The following three sets of questions were nearly identical for teachers and students.

The questions were aimed at studying such aspects as pedagogical and psychological difficulties: 1) the teachers/students' readiness for online teaching/learning in general, 2) pedagogical difficulties: the procedures of online teaching/learning, in particular, methods, forms, means of giving/mastering knowledge, 3) psychological and technical difficulties faced both by teachers and students (the answers were supplemented with comments). In addition, we invited respondents to evaluate teaching by students and vice versa, to evaluate learning by lecturers during the hostilities in Ukraine, and also to indicate the difficulties they faced during their teaching/learning activities.

So, 65 teachers and 122 students from Ukrainian universities (mostly they were from the Eastern part of Ukraine, Kharkiv city) took part in the study.

University teachers were women predominantly (66.7%), and male participants were 33.3% of all participants. The age of the respondents ranged from 26 to 52 and above. The largest age category was made up of university teachers from 42-49 years old (Figure 1).

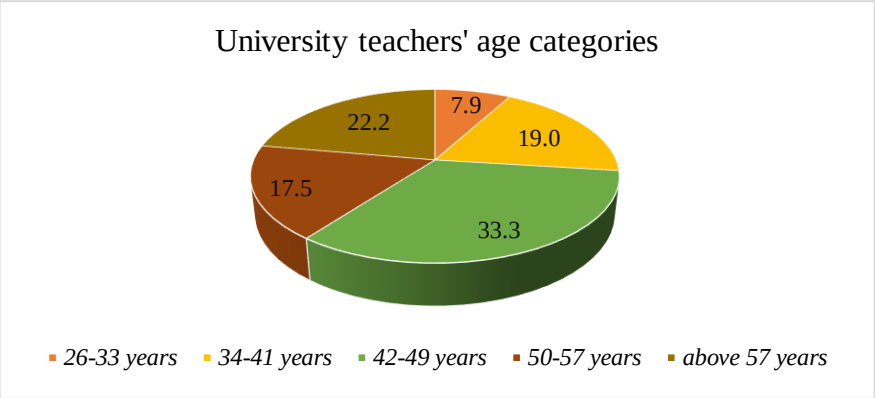

Figure. 1. Survey of university teachers by age categories, in percent

We found out that the majority of university teachers have advanced degrees (only 15.9% of respondents have Master's Degrees, mostly 63.5% have PhDs, and 20.6% have Post-Doctorate Degrees). The teachers are qualified enough, 65.1% of respondents have teaching experience of more than 17 years (Figure 2).

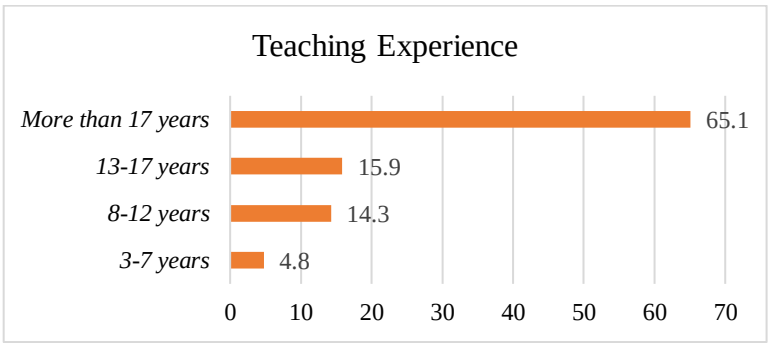

Figure 2. Survey of teaching experience, in percent

University teachers surveyed, who teach Bachelor students, is 28.6%, and, 3.2% of teachers work with students who are post-graduate students (getting PhD Degrees), 17.5% of respondents teach Master students, also 15.9% of respondents who teach students of all education levels.

Clarifying the specialized area of teaching activities, we found out that 41.3% of participants are social sciences and humanities, teachers of technical sciences are 14.3%, computer sciences teachers are 11.1% and mathematics teachers are 27% (Figure 3).

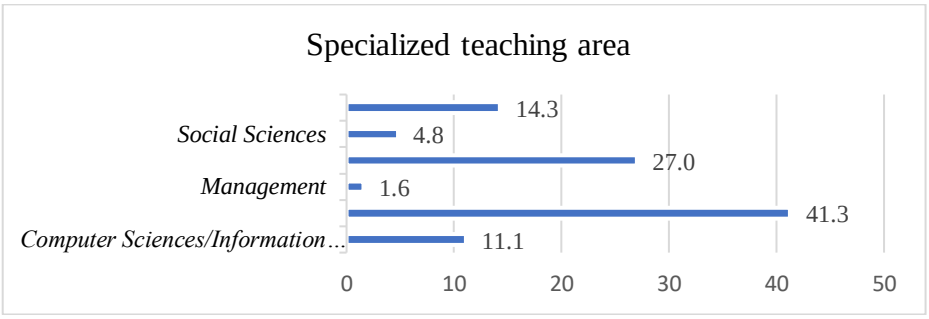

Figure 3. Specialization of teaching area, in percent

The participants of the second group in the survey consisted of students from the same 5 universities in Kharkiv city. It was 59.8% female and 40.1% male. The largest age categories were students aged 19-20 years old (31.1%) and 21-22s years (37.7%), who were studying in the second or third year of university (Figure 4).

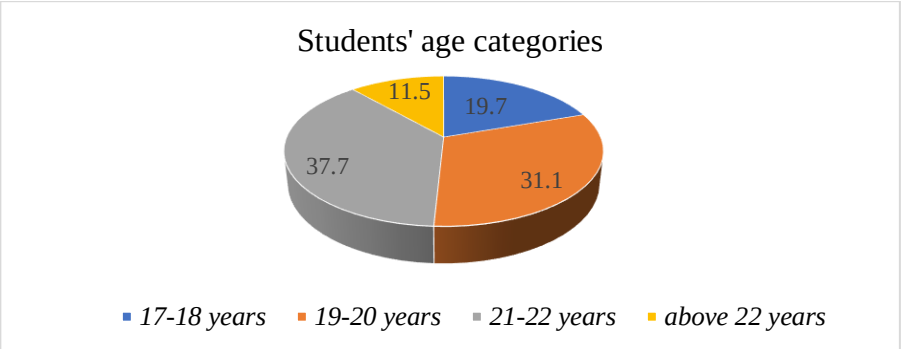

Figure 4. Survey of students by age categories, in percent

Our students study various specialties at universities, mainly they were studying for Bachelor's degrees. As we can see below, they were pre-service teachers, future engineers, biologists, lawyers, economists, mathematicians, system analysts, philologists, and agronomists (Figure 5).

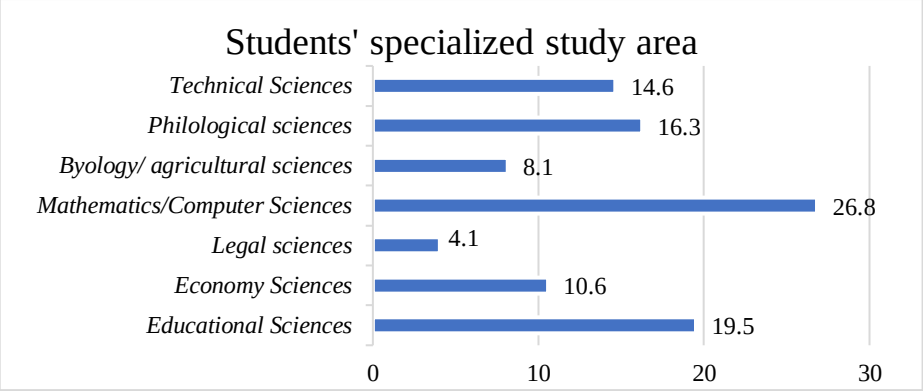

Figure 5. Specialties mastered by students who took part in the survey, in percent

The survey data was obtained by filling in two Google forms online and compiling them into Excel tables for results. We systematized the received responses and got the following results to understand the effective methods, forms, and techniques of teaching and learning in wartime.

3. RESULTS

Let's start with the survey results about pedagogical and psychological difficulties concerning the readiness for online teaching. University teachers who took part in the survey showed a high level of readiness for teaching students, and the new data is already significantly higher and different from the results that we received earlier when researching teachers' readiness during the Covid-19 pandemic [2]. Teachers testified their high readiness to organize online teaching. The results of the teachers' survey are presented in the diagram below (Figure 6).

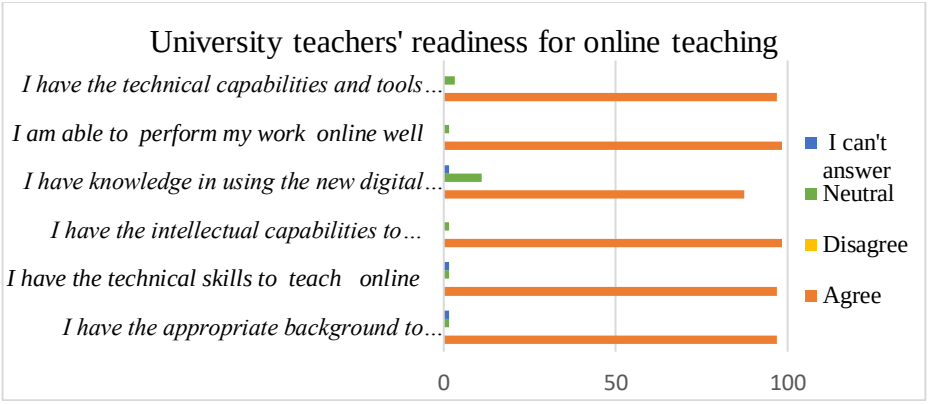

Figure 6. The results of teachers' answers to questions regarding their readiness for online teaching

The students answering questions confirmed their readiness for online learning too. So, the confidence that they have the appropriate backgrounds to study online was expressed by 90.2%; 95.9% of respondents have the technical skills to study online; and the intellectual capabilities to study online 94.3% of students; 80.3% of students feel able to study well online, and 89.3% of respondents have the technical capabilities and tools (equipment) to the study online. Well, our results showed a high level of students' readiness to study online (Figure7).

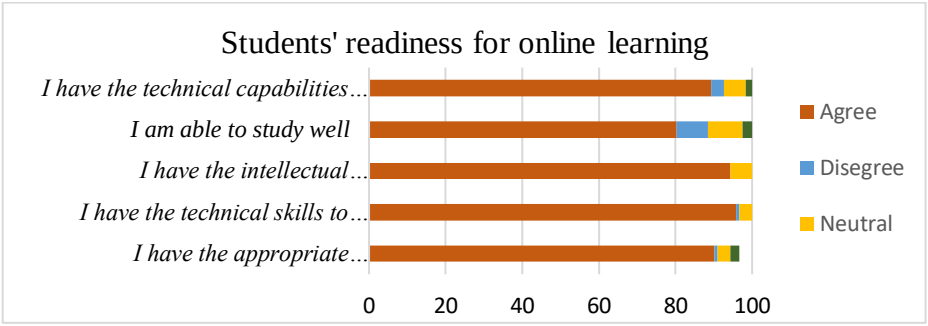

Figure 7. The results of students' answers to questions regarding their readiness for online study

The second group of questions for university teachers related to pedagogical difficulties in teaching organization online. We have seen basic methods (online and offline), several teaching forms such as lectures, seminars, practical classes online, and, finally, different tools/means/platforms (video/audio recordings, corresponding on emails, social networks, Moodle platform, etc.).

After examining the main methodological basics that teachers use, we found out that most teachers have online classes (85.7%), use previously developed offline courses (mainly on the Moodle platform) (76.2%), and, along with this, also they try to use various forms of keeping in touch with students, such as correspondence via social networks (44.4%), and task distribution by e-mails such as corporate e-mails (58.7%) (Figure 8). Also, teachers indicated that they use some messengers (in particular, Telegram) to communicate with students and send assignment lists. As we revealed, lecturers do not prefer pre-prepared video recordings of lectures, but they do it during their online lectures.

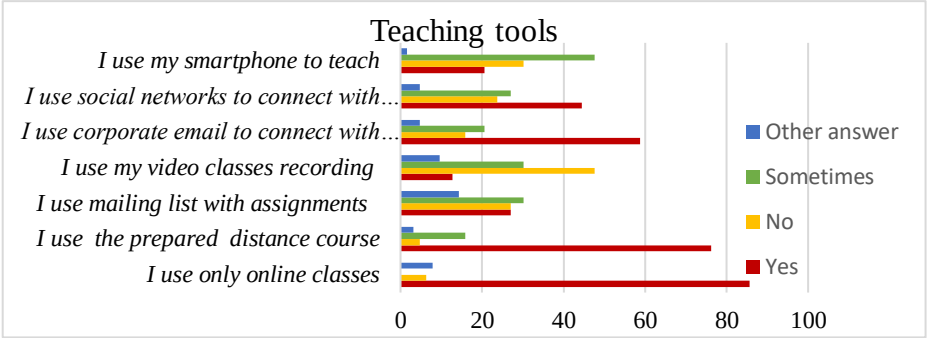

Figure. 8. Teaching tools for training online

We offered students similar questions about online learning tools/means/platforms/techniques. Students, like teachers, consider attending online lectures to be a more effective way of acquiring knowledge. Although they still use active distance courses offered by teachers (82.9%), especially since this is a convenient way of obtaining both theoretical knowledge and practical tasks for independent study. About 2% of students added that they use Google Classroom to communicate with teachers and use their emails to send homework. Lecture video recordings are used by 37.7% of students. Students prefer to communicate with teachers through e-mails (56.6%) and social networks like Telegram (55.7%). Unlike teachers, students often use their smartphones in online learning (68.9%) (Figure 9).

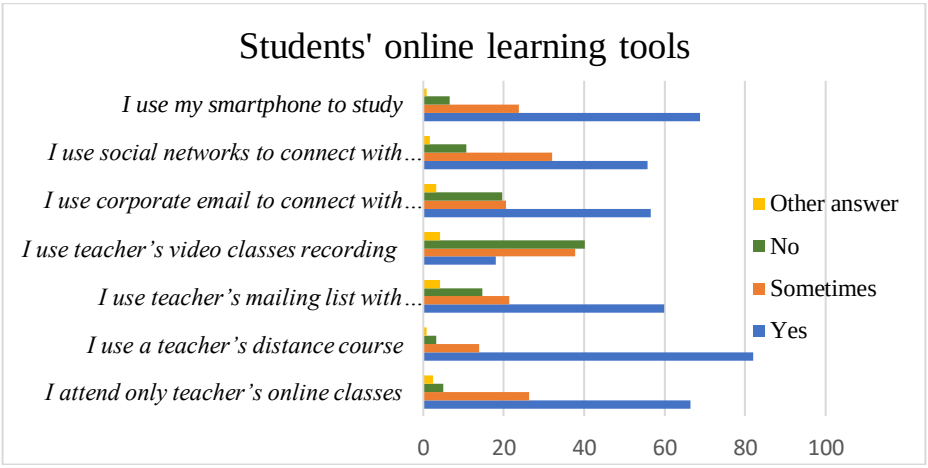

Figure 9. Learning tools used by students in the online study

Let's consider the answers to the third group of questions regarding psychological and technical difficulties that the respondents may have encountered. We suggested some of the technical difficulties and also asked the respondents to indicate their version at their discretion. In addition, we asked the respondents to describe their psychological difficulties as a psycho-emotional state in a few sentences.

Finding out the psychological and technical difficulties faced by students, we determined that all of them were not associated with poor and incorrect of educational process organization, and this is evidenced by the valuation of teachers' work that the students evaluated at the end of the survey (Figure 10).

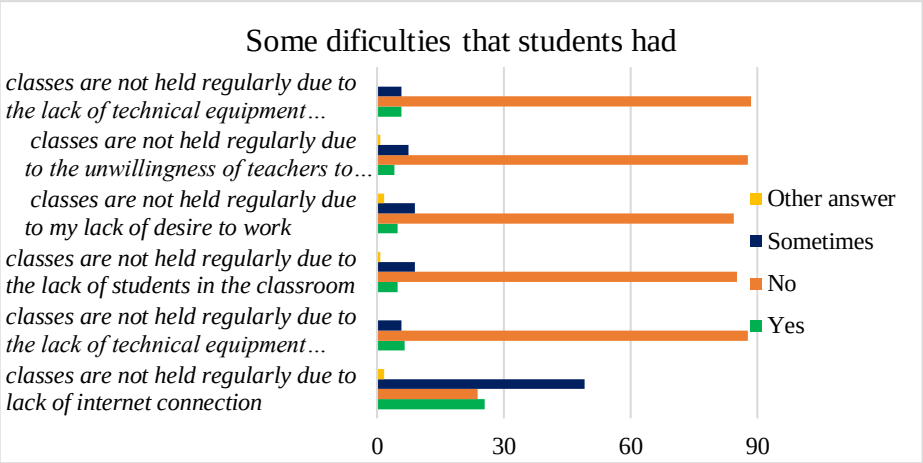

Figure 10. Online learning difficulties identified by students

Among the psychological and technical difficulties mentioned by the students, in the option "What other difficulties of a personal nature did you have with online study during the hostilities in Ukraine", the following were identified: lack of Internet connection (quotes from the students' answers: "When I was in the basement as a bomb shelter, there was no way to connect to the Internet"; "There may be no Internet in a shelter, and an alarm is quite common in Kharkiv"), lack of electricity (quotes from the students' answers: "Staying in a front-line city (Zaporizhia), raided by drones, turning the electricity off to the schedule and without, interruption of the Internet"; "…technical problems/remains of military operations on the territory of Ukraine").

As well as the presence of an alarm in the city or the country as a whole (quotes from the students' answers: "The presence of air alarms and shelling during our classes"; "Constant power outages, stress during shelling"), the shelling of Ukrainian cities by the Russian military (quotes from the students' answers: "Fighting is nearby"; "Missile hazard"; "Lack of electricity, Internet and communication to report about an absence or moving during the educational process, frequent relocations that lead to the untimely submission of test assignments, frequent stress and anxiety"; "Sometimes the Internet was down, the electricity was turned off, I was doing volunteer's job (that's why I didn't always attend classes)"; "…my relatives were on the occupied territory, I worried"; "It was impossible to get in touch, because it was restless in the city").

As you can see, there are many psychological difficulties in wartime. That is, if these external factors interfering with the entire educational process did not exist, then online learning would proceed according to a regulated schedule and would be successful and, thus, it would not cause those psychological difficulties (quotes from the students' answers: "psychological difficulties"; "moral status"; "depression"; "feeling burnt out"; "staying in another country due to the war"; "forced repeated change of residence; living in the area where there is no Internet; disconnection of electricity supply and Internet; living in different regions far from relatives; death of loved ones; high levels of stress and fear"; "…moral and psychological exhaustion; but I need to have a job to support the financial capacity of the family"; "I was under occupation"), according to the participants' answer, they had to cope with it the hardest.

Describing their psychological state, the students showed sincerity and trust. After analyzing their answers, we systematized and created a detailed psychological description of students during the war in Ukraine. Students indicated their status as anxiety, fear, sadness, and exhaustion. Somebody defined his/her state as a frustration. But despite everything, the majority of the participants showed a focus on positive thinking, considering online education as an

opportunity to switch attention and plunge into another reality, which can transfer them to a peaceful student life.

Here are quotes from the students' answers: "During the hostilities, for me, a study helped me to distract myself from the surrounding events"; "My mental state has certainly changed, I feel frequent worries, my health and well-being have deteriorated significantly, there were moments when I could not gather my thoughts and then it was extremely difficult to do something academically well and be active and do everything that was required, it seems that I have no strength at all, and the online learning allows me to adapt".

The answers also were: "It is difficult to abstract from constant explosions and focus on learning, but it is better to continue my study"; "I didn't have big problems with my psychological state, and if something happened, I switched to another task, it helped me"; "Because of the shelling at nights, I had time to rest during the day. It's a good distraction when I have home tasks"; "I am scared and sad sometimes because of the war, like any normal person, but it does not prevent me, particularly from studying at the university"; "Anxious and stressed sometimes affected the perception of the learning material, but the psychological state normalized more or less over time and learning came to a relative standard".

So, there were pedagogical, psychological, and technical difficulties in students' learning in the war.

The teachers' work in such a difficult period of the history of Ukrainian society was rated quite highly. So, 46.7% of students rated the teachers' work as excellent and, 43.4% rated it as good, only 3.3% rated it as unsatisfactory (badly or very badly). There are the following statements among the students' comments: "In my opinion, the training was organized successfully. The students had the opportunity (whoever wanted) to acquire knowledge at the appropriate level"; "I was successful in my studies, despite the power outages and sometimes unstable Internet, the teachers in such a case tried to postpone classes or if it was possible to have them later at any convenient moment".

The quotes also were: "I succeed in everything in my studies. The work of teachers during the period of active hostilities was excellent, and therefore the educational process went easily"; "…most of the teachers excellent and, most importantly, adequate people who understand the situation and make learning process, passing exams comfortable enough for students who have jobs or complications in life". Commenting on their failures in online study, students most often indicate problems related to technical impossibility, or personal unwillingness to learn, and rarely blame the failure in education on the incompetence or pickiness of teachers, Figure 11.

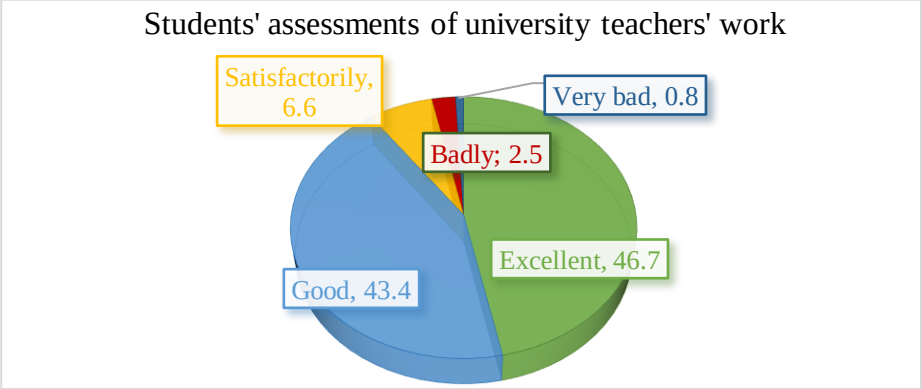

Figure 11. Evaluation of teachers' work in wartime during online learning by students

Despite all the difficulties of the military situation in Ukraine, the educational system continues its work, and teachers, like fighters of the Ukrainian educational front, stand in the defense of the youth, supporting them in learning, helping to self-developing and cope with all

training difficulties in the realities of the ongoing war between Ukraine and Russia. And as we can see, the students appreciated and recognized it. Moreover, students appreciated highly their achievements (Figure 12). At the same time, 33% of students described various difficulties (which we mentioned above) in their studies that they had to face in the conditions of active hostilities on the territory of Ukraine.

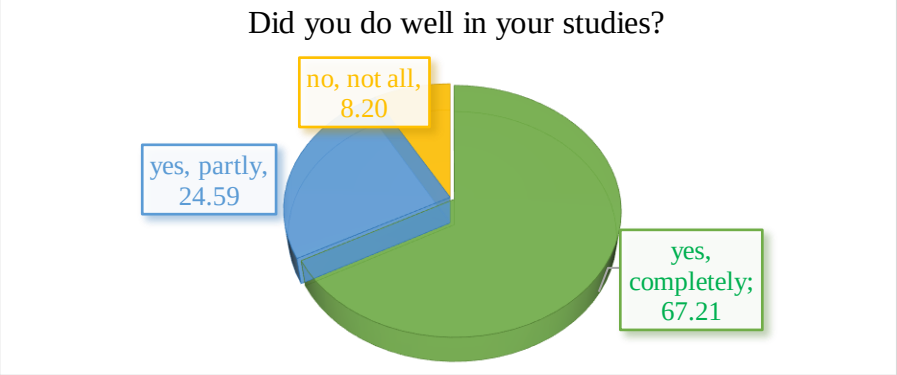

Figure 12. Assessment their own achievements by students

Finding out the pedagogical, psychological, and technical difficulties that teachers had during their work online, we got the following results (Figure 13).

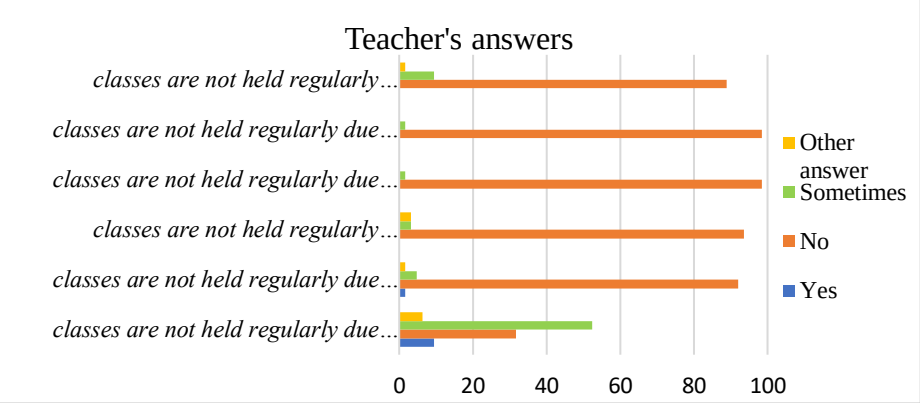

Figure 13. Online teaching difficulties identified by teachers

Analyzing the teachers' answers, we saw that online classes were regular, students attended classes, there was no unwillingness (desire) to teach or unwillingness to train, and all participants in the educational process had basic technical capabilities (equipment). Classes were not held only due to external factors such as the lack of electricity, the lack of Internet connection, the air alert, or the constant shelling of places where teachers were located.

The teachers also mentioned other pedagogical, psychological, and technical troubles that happened (quotes from the teachers' answers): 'The necessity of evacuation, changes in living and working conditions"; "Sleepless nights due to shelling"; "Blackouts in winter prevented quality to be ready to upcoming classes, in particular, some tasks for students as assignments, lectures, etc."; "Feeling of fear among students"; "Sometimes it was difficult to concentrate because of the constant alarm signals in different cities where the students and I were, especially since according to the rules as during an alarm I should go down to the bomb shelter"; "Lack of Internet among students and anxiety"; "The impossibility to use the laboratory equipment for classes completely".

The teachers treated the students with respect and understanding, as evidenced by the students' answers, and they also rated highly the students learning (Figure 14).

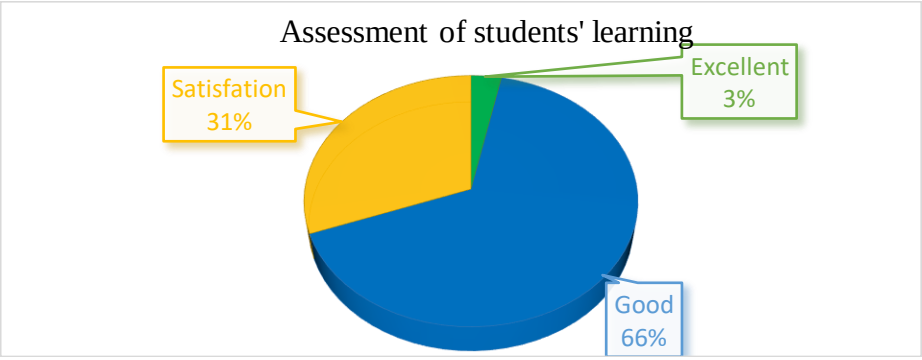

Figure 14. Teachers evaluated the students' learning

The teachers assessed their teaching success as the achievement of the set educational goals (that is, the planned learning material was taught, and the activities in classes were different): 52.4% of teachers noted that teaching was completely successful, 30.2% almost completely, i.e. partially, and sometimes. Only 14.3% of teachers answered that the set goals were not achieved, Figure 15. At the same time, it was technical troubles that were cited as the main reason for not goal achieving. Also, teachers singled out such reasons for unsuccessful teaching as students' inability to attend classes the low level of activities in classes, and psychological problems in personal development caused by military actions on the territory of Ukraine.

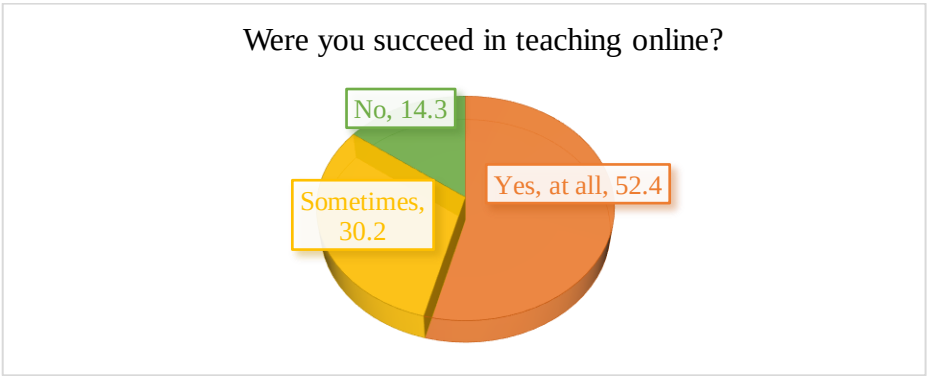

Figure 15. Teachers evaluated their success in teaching online

Honestly, 56.9% of teachers had sometimes a depressed psychological state too. Describing their psychological state, teachers noted that they had fear and anxiety, sometimes they had nervousness due to the lack of electricity or Internet, and the inability to prepare properly for classes and have them during air alert. Moreover, they did not associate their depressed psychological state (quoting from teachers' answers) with "teaching online", underlining that "only the situation in the country affects it, but I hold on and it is not reflected in my work", and the most "excitement during shelling and air alarms, because thoughts appeared about something else, which sometimes interfered and distracted attention in classes".

A significant number of teachers expressed that the biggest problem that caused a feeling of nervousness was trying to "have time to prepare for the next day's classes when we had electricity only 6 hours a day and part of it was in my classes time" and, of course, it was difficult to teach students who were under the occupation or who were after de-occupation,

because their psychological state was unstable. Among other things, the teachers noted that "the most difficult thing was to motivate students to learn", to keep their concentration of attention to study and activity in classes.

However, despite all the pedagogical, psychological, and technical difficulties and problems, teachers noted that "teaching and communication with students did not allow to fall into a depressive state completely", "sometimes anxiety was during classes, but thanks to communication with students, it was managed to be muted" (quotes from answers). It should be emphasized that, in general, there is an optimistic mood of teachers and an opinion that is tracked in all answers, such as: "It is important to emphasize the ability to teach staff to work without stopping at anything, worries (making records for students), especially looking for new interactions", "there are certain negative points, but I can deal with them if I wish", and supporting students to get a qualified special education in this difficult time for Ukraine.

4. DISCUSSION

To discuss the problem, it is necessary to state different researchers' opinions. We agree that "on the one hand, study progress is not feasible or sustainable when students live in situations of war or occupation. On the other hand, … remote learning is capable of delivering the educational goals of the university to the areas affected by the war" [14].

The Ukrainian researchers state that "the values of survival seem to come to the fore as never before, what we are fighting for is related to the values of self-realization of people who cherish freedom more than their lives. Therefore, we should be aware that the present is critically dependent on the military forces, the economy, our ability to resist, diplomats, on those who support us. However, the future of our country depends on education. With this in mind, Ukrainian educators clearly understand that their mission is to create a new worldview that would ensure our development" [15].

It is no doubt, that we should "move beyond awareness toward a place of preparedness, togetherness, and action. To move forward together, taking action that will positively impact both fields of management education and those around us who have experienced trauma and need our support" [16].

We agree with our colleague, and researcher, that "higher education in Ukraine needs to strengthen the protection against military attacks and destruction. At the same time, the experience of organizing training during the war in Ukraine has revealed the need for broader measures related not only directly to educational institutions but also in general to the protection of infrastructure. In conditions of high risks of massive rocket attacks, this concerns primarily the protection of energy and utility infrastructure, since power outages and Internet absence do not allow universities to organize training even remotely" [6].

A great discussion is got around the war's negative effects: "mental health, fear, substance use, stress, loneliness, burnout… Further research is needed to confirm the findings including the long-term impact of the war on the health and well-being of Ukrainian citizens" [21]. The different issues are important too [22], [23], [24].

We are very pleased to our foreign colleagues for the support during the war, we need it. "As the international community considers future restoration efforts for Ukraine, it must give aid to the education sector. Providing safe learning areas for Ukrainian children and young adults will allow them to continue their studies. Sending financial assistance to Ukraine will also give it the resources it needs to rebuild its academic institutions and provide a quality education to its citizens. This, in turn, would lead to the development of a new generation of educated Ukrainian students who will use their knowledge and expertise to help rebuild their homeland. The possibilities of a brighter and better future for Ukraine would then be endless" [25].

The issue for the discussion can be the comparison of the average grades for the same subject but taught comparatively in on-site vs off-site teaching and learning, it can be the point of future research too. To our mind, the average grades for the same subject are connected more to variables like subject content and demands, exam difficulty, etc. than to psychological challenges. As for the cross-discipline research for psychological challenges, it can be developed for future research too, it can involve integrating diverse academic results, clearly defining research objectives, and employing a complex qualitative methodology that addresses the intricacies of the psychological phenomena under investigation. A complex qualitative methodology for investigating psychological challenges can involve employing nuanced and multifaceted research approaches, such as in-depth interviews, thematic analysis, and participant observation, to capture the intricate and context-dependent nature of the phenomena under study for future research.

5. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

Through extensive surveys conducted during the ongoing war in Ukraine, we have identified the pedagogical, psychological, and technical challenges of online teaching for university students. The pedagogical challenges were overcome by conducting online classes via the popular communications platform Zoom, Meet, which allows teachers and students to connect via video, audio, phone, and chat. The teachers were ready for online teaching, as the students for online learning. The challenges were overcome with the previous experience of using online technology communication during the pandemic and pre-existing offline learning courses, primarily hosted on Moodle and different inner university platforms. In tandem with these online methods, many university teachers are actively maintaining contact with their students through social networks and distributing assignments via corporate email platforms. Furthermore, teachers indicated their use of various messaging apps, such as Telegram, for communicating with students and sharing assignment lists. The procedures of online teaching connected with methods, forms, and means were known. The acquired teaching experience, skills, and backgrounds in using online teaching helped teachers to establish online education with students, conquer pedagogical difficulties, and continue teaching.

It is noteworthy that teachers do not exhibit a strong preference for pre-recorded video lectures online, but tend to create such recordings during their live online sessions. Remarkably, students share the perspective that attending live online lectures is an effective means of knowledge acquisition online, although they also actively utilize distance learning courses provided by their teachers. This approach is seen as convenient for gaining both theoretical knowledge and practical assignments for independent study online. A small percentage of students reported using Google Classroom for university teachers' communication and submitting homework. Notably, not many students utilize lecture video recordings for their studies. In terms of communication with teachers, students favor email and instant messaging apps like Telegram, and Viber. Unlike teachers, students frequently rely on smartphones for online learning, teachers frequently rely on laptops for online teaching. So, students conquer the challenges and continue online learning too.

The most common psychological difficulties with online learning were connected with external ones as constant shelling, and air alarms, as with internal ones as stress during shelling, anxiety, worries about relatives on the occupied territory, depression, feeling burnt out, psychological exhaustion, sadness, frustration, death of loved ones. The psychological states of both teachers and students were not satisfied at the beginning of the war, but later both teachers and students overcame the war stress.

Despite the advantages of online technologies that allowed continuing online education in wartime, the main technical difficulties in wartime were blackouts, lack of Internet

connection, constant explosions, shelling, power outages, the necessity of evacuation, changes in living and working conditions, frequent relocations, the impossibility to use the laboratory equipment. So, in general, online education is going on, thanks to the persistent cooperation and communication between teachers and students, gained experience in online education, and a clear understanding that it is necessary to teach and learn further well.

The prospects for further research are to find out the weakest sites of online technologies and to offer the decisions to solve them as online education at universities will continue.

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ВИКЛИКИ ДЛЯ УНІВЕРСИТЕТІВ ЩОДО ВПРОВАДЖЕННЯ ОНЛАЙН-ТЕХНОЛОГІЙ В УМОВАХ ВІЙНИ В УКРАЇНІ

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Анотація. Досвід онлайн-освіти в Україні під час війни є унікальним. Після початку російсько-української війни, через місяць так званих «канікул», з 1 квітня 2022 року, відповідно до наказу Міністерства освіти і науки України та наказів ректорів закладів вищої освіти розпочалось онлайн-навчання. Заняття проходили онлайн, було складно подолати стрес через війну, але досвід пандемії навчив працювати з такими онлайн-технологіями, як-то Zoom, Meet, Google Classroom. Навчання студентів проводилось як онлайн, так і офлайн за допомогою університетських платформ, наприклад, Moodle, які містили всі навчальні матеріали за попередні два роки пандемії: завдання, вікторини, тести. Мета дослідження – визначити педагогічні, психологічні та технічні проблеми в навчанні студентів закладів вищої освіти під час війни в Україні методом опитування. Опитування проводилось онлайн за участі 65 викладачів і 122 студентів з 5 університетів Харкова в Україні. Проаналізовано педагогічні, психологічні та технічні труднощі. Питання були спрямовані на вивчення таких аспектів: 1) педагогічні та психологічні труднощі: готовність викладачів/студентів до онлайн-викладання/навчання, 2) педагогічні труднощі: процедури онлайн-викладання /навчання, зокрема методи, форми, засоби надання/засвоєння знань, 3) психологічні та технічні труднощі, з якими стикаються викладачі/студенти. Результати дослідження наступні. Набутий досвід викладання та навчання з онлайн-технологіями допоміг швидко налагодити онлайн-освіту у воєнний час. Основні педагогічні труднощі вдалось подолати за допомогою таких базових дидактичних методів, форм, як-от: лекції, семінари, практичні заняття як онлайн, так і офлайн, — за допомогою різних інструментів/засобів/платформ (відео/аудіозаписи, комунікація електронною поштою, соціальними мережами, через платформу Moodle та інші). Також було досліджено психологічний стан як викладачів, так і студентів в умовах онлайн-навчання. Найпоширенішими психологічними труднощами виявились такі: зовнішні - постійні обстріли, повітряні тривоги, а також внутрішні - стрес, занепокоєння, депресія, виснаження, журба, розчарування. Технічні труднощі були пов’язані з відключенням світла, відсутністю Інтернету, відключенням електроенергії, необхідністю евакуації, зміни умов проживання чи роботи, переїздами, неможливістю використання лабораторного обладнання. Висновок полягає в тому, що, незважаючи на всі труднощі, якість онлайн-освіти суттєво не змінилась завдяки чіткому розумінню необхідності викладати та навчатися під час війни.

Ключові слова: онлайн-освіта; навчальні технології; засоби навчання; студенти закладів вищої освіти; російсько-українська війна**.**

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